Suisun Marsh Monitoring Program
Channel Water Salinity Report

Reporting Period: May 2005

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1. SUISUN MARSH MONITORING STATIONS AND REPORTING REQUIREMENT

As per SWRCB Water Rights Decision 1641, dated December 29, 1999, and previous SWRCB decisions, the California Department of Water Resources (DWR) is required to provide monthly channel water salinity compliance reports for the Suisun Marsh to the SWRCB. Conditions of channel water salinity in the Suisun Marsh are determined by monitoring specific electrical conductivity. Specific electrical conductivity is referred to in the reports as "specific conductance". The locations of all listed stations are shown in Figure 5.

The monthly reports are submitted for October through May each year in accordance with SWRCB requirements. The reports are required to include salinity data from the stations listed below:

Station Identification	Station Name	General Location	Classification
C-2*	Collinsville	Western Delta	Compliance Station
S-64	National Steel	Eastern Suisun Marsh	Compliance Station
S-49	Beldon's Landing	North-Central Suisun Marsh	Compliance Station
S-42	Volanti	North-Western Suisun Marsh	Compliance Station
S-21	Sunrise	North-Western Suisun Marsh	Compliance Station

Data from the stations listed below are included in the monthly reports to provide information on salinity conditions in the western Suisun Marsh.

Station Identification	Station Name	General Location	Classification
S-97	Ibis	Western Suisun Marsh	Monitoring Station
S-35	Morrow Island	South-Western Suisun Marsh	Monitoring Station

Information on Delta outflow, area rainfall, and operation of the Suisun Marsh Salinity Control Gates are also included in the monthly reports to provide information on conditions that may affect channel water salinity in the Marsh.

* Throughout the report, the representative data from nearby USBR station is used in lieu of data from station C-2.

2. Monitoring Results

2.1 Channel Water Salinity Compliance

During the month of May, 2005, salinity conditions at all five compliance stations are in compliance with channel water salinity standards of SWRCB (Table 1). Compliance with standards for the month of May was determined for each compliance station by comparing the progressive daily mean of high-tide specific conductance (SC) with respective standards. The standard for compliance stations C-2, S-64, S-49, S-42 and S-21 were 11.0 mS/cm during May 2005. Table 1 lists monthly mean high-tide SC at these compliance stations. The progressive daily mean (PDM) is the monthly average of both daily high-tide SC values. The mathematical equation is shown below.

$$\text{PDM} = \frac{\sum \text{daily average of high tide SC}}{\text{\# days of the month}}$$

2.2 Delta Outflow

Unlike previous May months, outflow for May 2005 started off low and ended with a record high at the end of the month. Outflow was about 20,000 cfs at the beginning of May, then increased thereafter to about 50,000 cfs in mid-May and peaked to a record high of about 96,000 cfs on May 24, 2005 as a result of unusual precipitation events. Compared to previous May months of five years, May 2005 monthly average outflow was the highest recorded. The monthly Delta outflow is represented by the mean Net Delta Outflow Index (NDOI). The NDOI is the estimated daily average of Delta outflow. Mean NDOI for May is listed below:

Month	Mean NDOI (cubic feet per second)
May	50,745

2.3 Rainfall

Total monthly rainfall at the Waterman Gauging Station in Fairfield during May 2005 was very unusual and as a result, set a record high compared to previous May months. The largest precipitation occurred on May 9 with the daily total of 0.78 inches.

Month	Total Rainfall (inches)
May	1.46

2.4 Suisun Marsh Salinity Control Gate (SMSCG) Operations

Operations and flashboard/boat lock installations at the SMSCG during May 2005 is summarized below. The gates continued to be operated to control salinity with boat lock open configuration per NOAA request for the remainder of the control season.

Date	Gate status	Flashboards status	Boat Lock status
May 1-19	Open	**Installed**	Open
May 20-31	Open	**Out**	Open

During May 2005, SMSCG operation continued to cease due to favorable water quality levels in the marsh, and as a result the flashboards were removed on May 20 since water quality was not of a concern for the remainder of the control season.

3. Discussion

3.1 Factors Affecting Channel Water Salinity in the Suisun Marsh

Factors that affect channel water salinity levels in the Suisun Marsh include:

- delta outflow;
- tidal exchange;
- rainfall and local creek inflow;
- managed wetland operations; and,
- operation of the SMSCG and flashboard configurations.

3.2 Observations and Trends

3.2.1 Conditions during the Reporting Period

During May 2005, salinity levels at Collinsville(C-2), National Steel(S-64), Beldons (S-49), Sunrise Club(S-21), and Volanti(S-42) were no higher than 2.5 mS/cm as shown in Figure 1. At the two monitoring stations, S-97 and S-35, salinity levels were no higher than 3.2 mS/cm as shown in Figure 2. Salinity levels at both eastern and western marsh stations were already low at the beginning of May due to high Delta outflow carry over accumulation from previous months. And due to unusual precipitation events in May 2005, water quality concern was no longer an issue because conditions were too fresh. Both compliance and monitoring stations salinity levels continued to decline as shown in Figures 1 and 2 at a varying rate due to each station proximity; however, at Collinsville salinity level flatten out because it has reached the maximum freshness level and will not go any lower.

Overall, salinity levels were well below standards at all compliance and monitoring stations.

3.2.2 Comparison of Reporting Period Conditions with Previous Years

Monthly mean high-tide SC at the compliance and monitoring stations for May 2005 were compared with means for those months during the previous nine years (Figure 4).

Means salinity pattern of all compliance and monitoring stations are similar to that of 2003, but slightly higher in magnitude. Compared to previous nine years, May 2005 salinity levels were ranked fifth in high Specific Conductance.

Table 1

Monthly Mean High Tide Specific Conductance at Suisun Marsh Water Quality Compliance Stations

May 2005

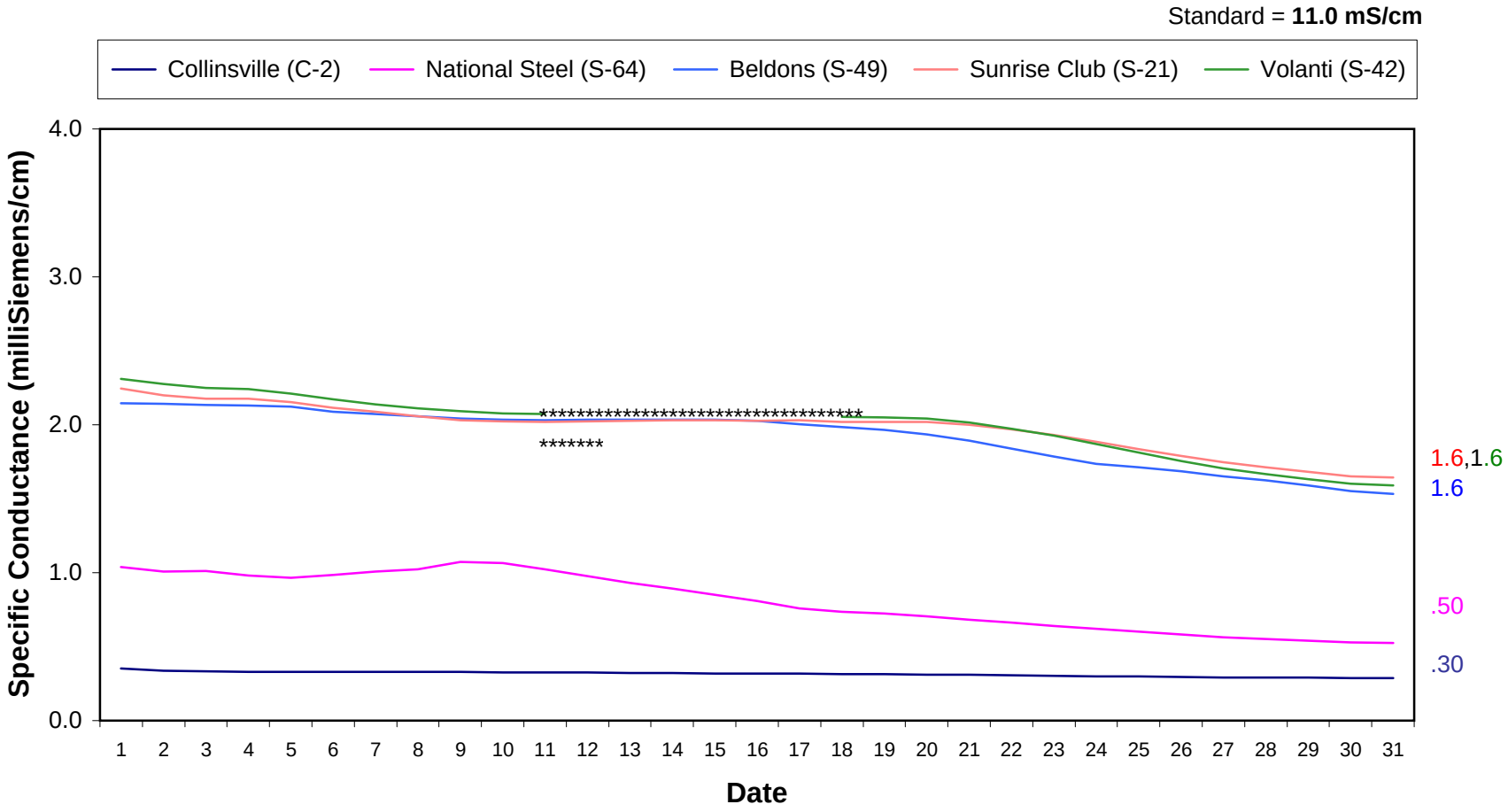
Station	Specific Conductance (mS/cm)*	Standard	Standard meet?
C-2**	0.3	11.0	Yes
S-64	0.5	11.0	Yes
S-49	1.5	11.0	Yes
S-42	1.6***	11.0	Yes
S-21	1.6	11.0	Yes

*milliSiemens per centimeter

**The representative data from nearby USBR station is used in lieu of data from station C-2.

*** S42 had days of missing salinity data due to salinity equipment failure. However, the number of missing data is not enough to alter the outcome of end of month PDM value.

Figure 1. Suisun Marsh Progressive Mean High Tide Specific Conductance
May 2005



********** Missing data due to equipment failure at S-42.

Figure 2. Suisun Marsh Progressive Mean High Tide Specific Conductance
May 2005

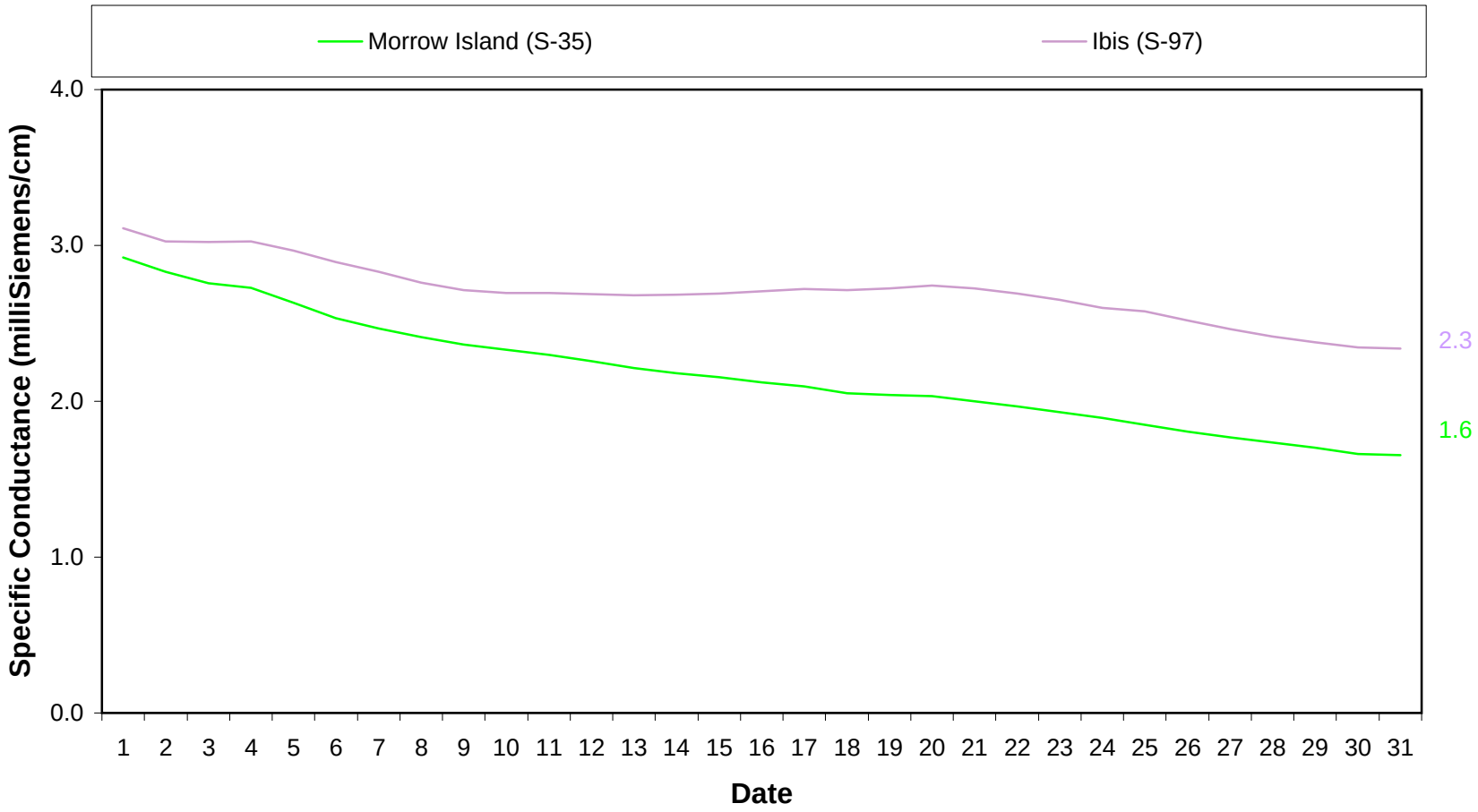
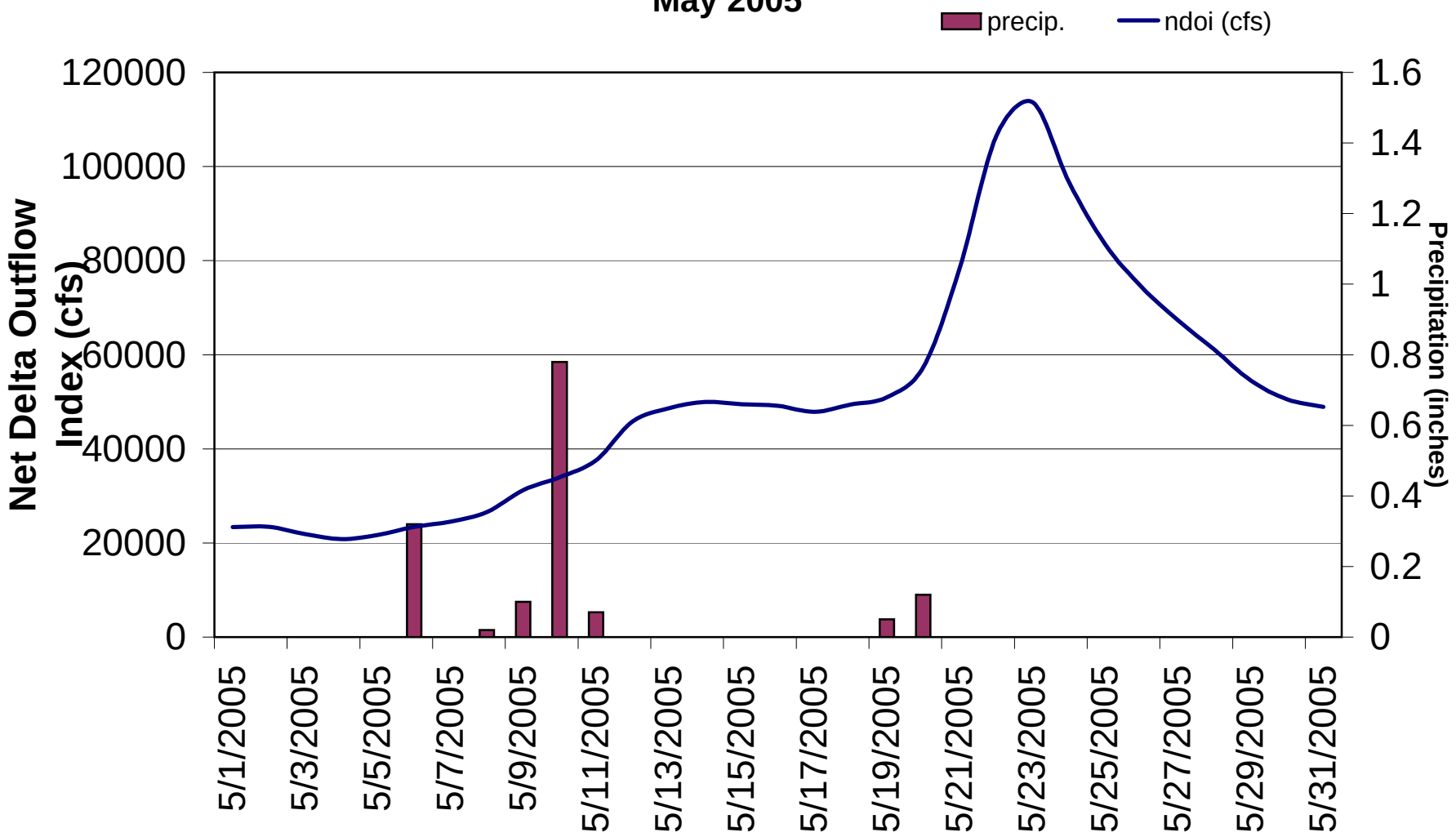
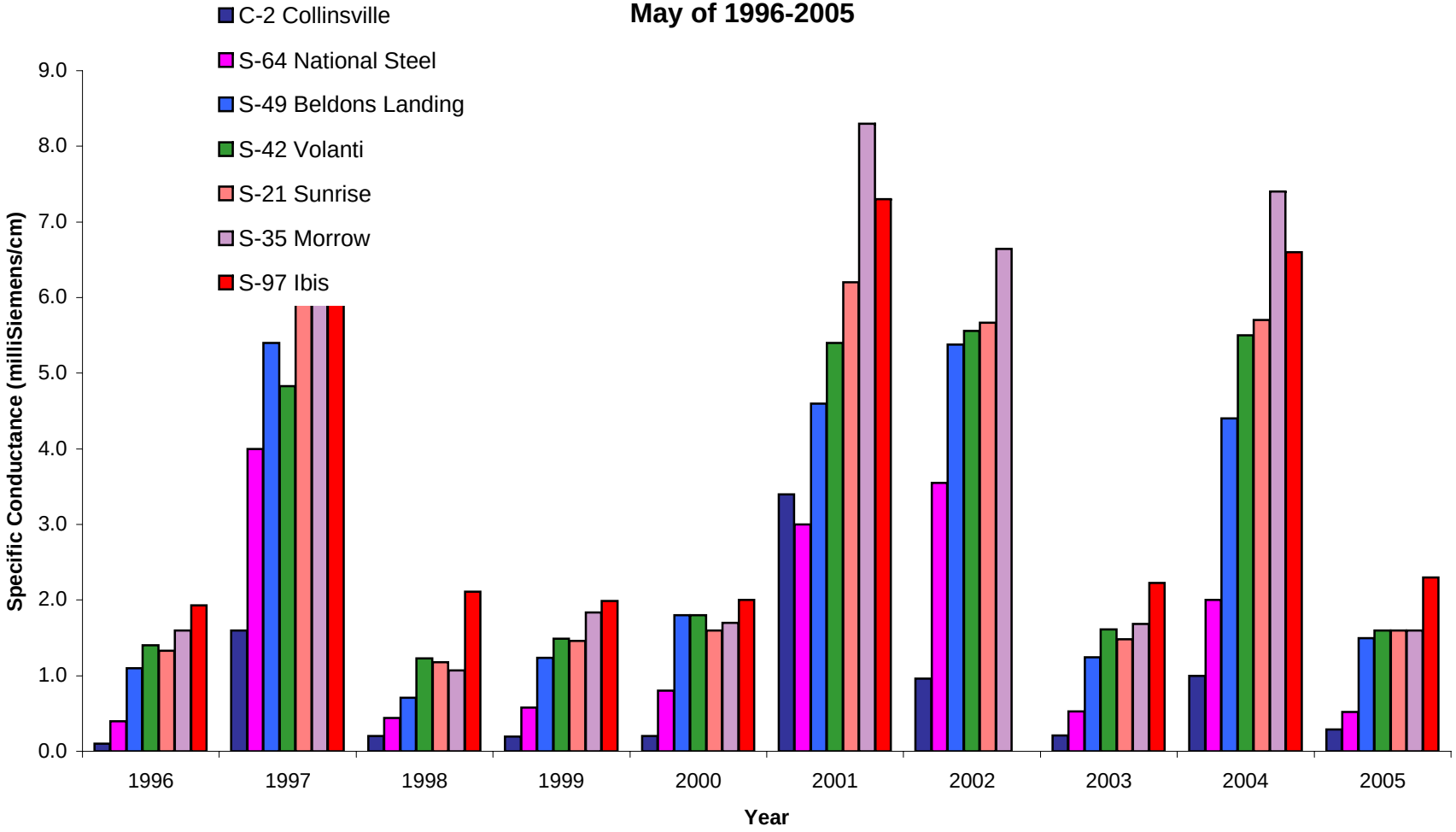


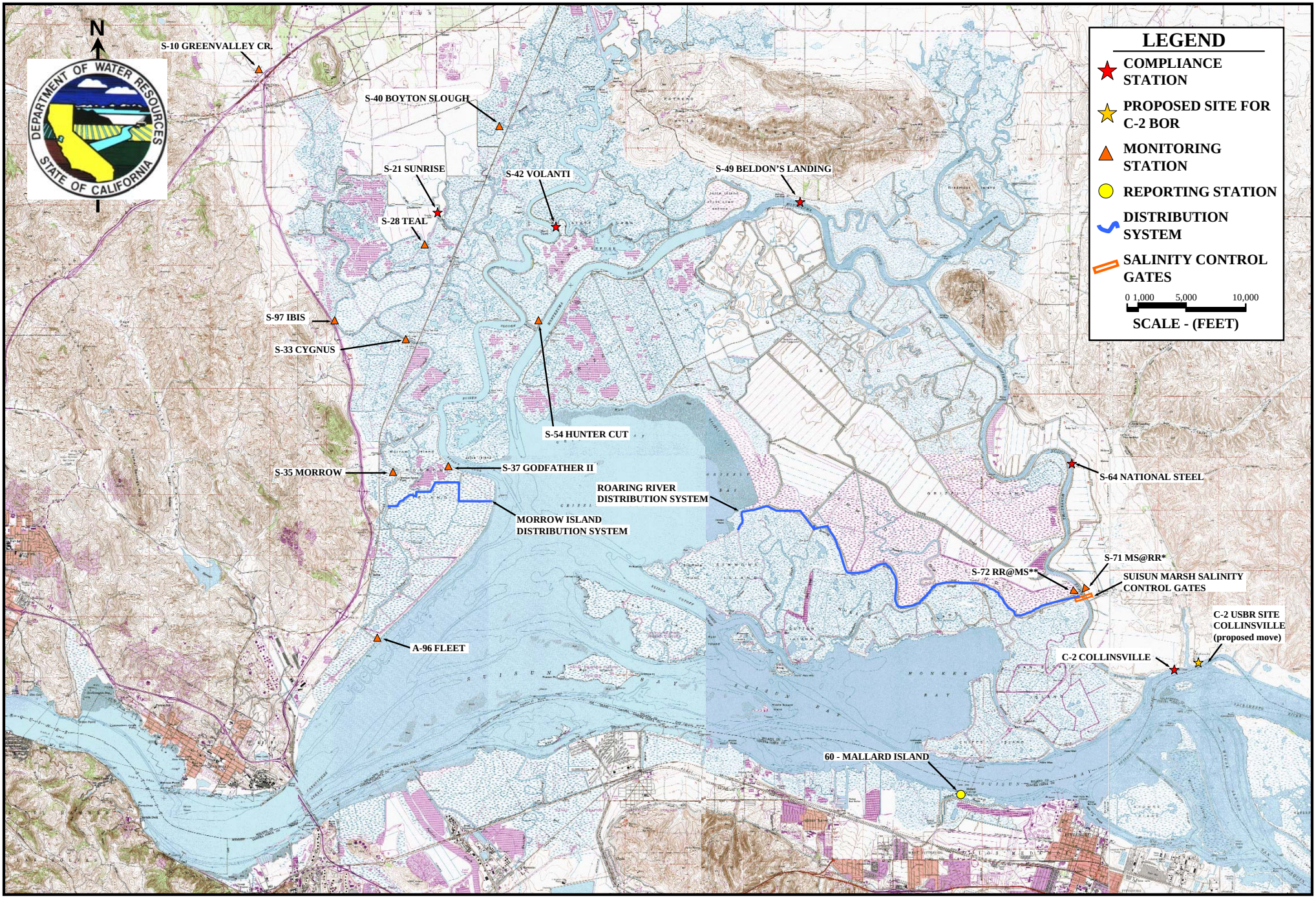
Figure 3. Daily Net Delta Outflow Index and Precipitation*
May 2005



*Preliminary DWR, O&M data

Figure 4. Monthly Mean Specific Conductance at High Tide:
Comparison of Monthly Values for Selected Stations
May of 1996-2005





SUISUN MARSH PROGRAM WATER QUALITY MONITORING AND CONTROL FACILITIES